



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2024

Construction Studies

Theory - Ordinary Level

(200 marks)

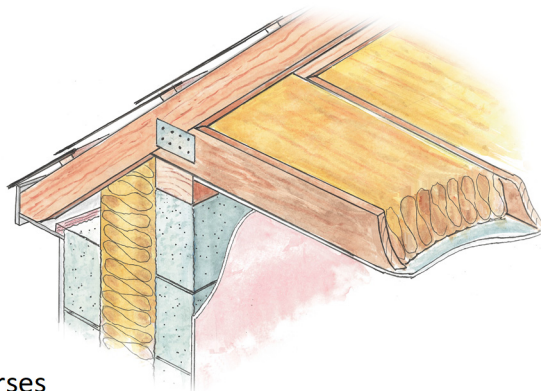
Friday, 14 June
Afternoon, 2:00 - 4:30

- (a) Answer **any four** questions.***
- (b) All questions carry equal marks.***
- (c) Answers must be written in ink.***
- (d) Drawings and sketches are to be made in pencil.***
- (e) Write the number of the question distinctly before each answer.***
- (f) Neat freehand sketches to illustrate written descriptions should be made.***
- (g) The name, sizes, dimensions and other necessary particulars of each material indicated must be noted on the drawings.***

Do not hand this up.

**This document will not be returned to the
State Examinations Commission.**

1. The sketch shows portion of the eaves of a pitched roof constructed using prefabricated trussed rafters. The roof is supported on a 400 mm concrete block wall with a full-fill insulated cavity. The roof has a pitch of 30° and the trussed rafters are 200 mm × 40 mm. The slates are fixed to 50 mm × 30 mm battens, on a breather membrane. The roof is highly insulated at ceiling joist level.



- (a) To a scale of 1:5, draw a vertical section through the external wall of the house and through the eaves of the trussed roof. On your drawing, show the typical construction details from a level 400 mm below the wallplate, through the wall and eaves of the roof. Include the first three courses of slate at eaves. Include **three** typical dimensions on your drawing.
 - (b) On your drawing, show how the wallplate is secured to the external wall.

2. New homeowners wish to improve the Building Energy Rating (*BER*) of their home which was built over 30 years ago. The external wall is a concrete block wall with a partially insulated cavity. It is proposed to fix insulation to the inside surface of the external walls, and to install new windows.

- (a) Discuss **two** advantages of improving the Building Energy Rating (*BER*) of a home.
 - (b) Using notes and freehand sketches, show **one** suitable method of applying insulation to the internal surface of the walls. Show on your sketch how the wall is to be finished internally. Specify the type and thickness of insulation.



- (c) Discuss **two** reasons why external wall and window upgrades should be carried out at the same time.

3. The sketch shows a bathroom with a shower area suitable for a person with limited mobility.

- (a) Using a single-line labelled sketch, show the pipework required to provide hot and cold water to a mixer-shower and wash basin, and to provide cold water to a toilet cistern.

Include the following in your sketch:

- rising main
- insulated cold water storage tank
- hot water cylinder
- pipework to bathroom fixtures
- all necessary valves.



- (b) Discuss **two** features that should be included to ensure a shower area is suitable for a person with limited mobility.

4. The sketch shows a front entrance wall and driveway under construction. The entrance wall is a 215 mm concrete block wall and is finished with 200 mm natural stone on one side.

(a) Discuss **two** advantages of choosing a natural stone finish for an entrance wall.

(b) Using notes and freehand sketches, show the typical design detailing of the strip foundation for this wall.

Include the following in your sketch:

- strip foundation
- steel reinforcement
- position of wall on foundation
- typical dimensions of the foundation.



(c) Specify a suitable surface finish for the driveway, and give **two** reasons for your choice.

5. A triple glazed window with a wooden frame, is fixed in a 400 mm external block wall with a full-fill insulated cavity. The wall is rendered on both sides. The fixed frame of the window is 120 mm × 80 mm and is thermally broken.

(a) To a scale of 1:5, draw a vertical section through the external wall and the bottom of the window. Show the typical construction details from a level 400 mm below, to a level 300 mm above, the concrete window cill.

Include **three** typical dimensions on your drawing.

(b) On your drawing show how to prevent moisture penetration at the window cill.



6. The sketch shows a site dumper in operation on a construction site.

(a) Describe **two** safety precautions that the driver must observe when operating a site dumper.

(b) Using notes and freehand sketches, show **three** items of personal protective equipment (PPE) which should be worn by workers when working with construction vehicles. Give **one** specific reason why each item of personal protective equipment must be worn.



(c) Give **two** reasons why vehicle operators must undertake a specific training course prior to operating a vehicle on a construction site.

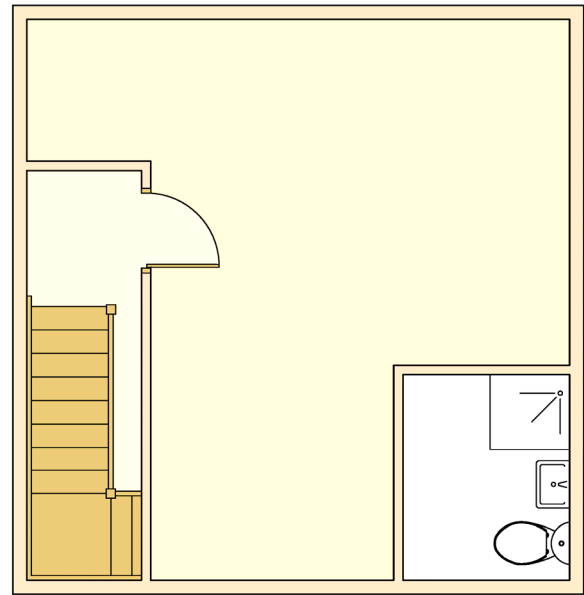
7. A draft design for an attic conversion to include a bedroom with an en suite bathroom is shown. The position of the stairs, en suite bathroom, and a door to the bedroom are included.

(a) Discuss **two** advantages of converting an attic space into a bedroom.

(b) Draw a large freehand sketch of the given design and show your preferred location for **each** of the following in the attic bedroom:

- access to en suite
- double bed
- clothes storage unit
- study space.

Give **one** reason for selecting **each** location.



(c) Specify a suitable floor covering for the bedroom and give **two** reasons for your choice.

8. Explain, with the aid of notes and freehand sketches, any **five** of the following:

- | | | |
|------------------------|------------------|---------------------|
| • site planning notice | • halving joint | • faceplate turning |
| • smart lighting | • cordless drill | • plywood |
| • gulley trap | • cavity closer | • heat pump. |

9. The sketch shows the rear of a modern semi-detached house with a family room extension. The walls and roof of the family room are finished externally with zinc cladding.

(a) Discuss **two** reasons why zinc is a suitable cladding material for modern homes.

(b) Using notes and freehand sketches, show **two** modifications to the family room that would allow for the following:

- additional natural light
- access to the rear garden.

(c) Discuss **two** advantages of providing access to the rear garden from the family room for the occupants of the house.

